VDH VIRGINIA DEPARTMENT OF HEALTH

Arsenic Fact Sheet

What is arsenic and where do you find it?

Arsenic is a naturally occurring element that is widely distributed in the earth's crust. Arsenic can exist in several oxidation states with other elements as inorganic or organic arsenic. It is a silvery-gray, semimetallic substance that tarnishes in air. Inorganic and organic arsenic compounds are white in color, and have no smell or special taste. Inorganic arsenic occurs naturally in certain types of soils and rock formations. Inorganic arsenic compounds are mainly used as a preservative in pressure-treated wood to make it resistant to rotting and decay. Organic arsenic compounds are used to make insect killers, weed killers, and fungicides.

Who is exposed to arsenic?

Anyone can be exposed to arsenic since low levels of arsenic are present in soil, water, food, and air. People are primarily exposed to arsenic through eating food (fish and shellfish), drinking water, or breathing air containing arsenic. If wells are drilled in areas where naturally occurring arsenic is present in the soil or rock, drinking water can become contaminated with arsenic. Other sources of exposure are breathing in sawdust or burning smoke from arsenic-treated wood, living near hazardous waste sites, and living in areas with naturally elevated levels of arsenic in rock.

How does arsenic get into and leave the body?

Arsenic enters the body through inhalation or ingestion. Most of the arsenic that is inhaled will settle in the lungs where it is then distributed to the bloodstream. Once in blood, the liver changes much of the arsenic into less harmful forms. Only a minimal amount of arsenic is absorbed through the skin. Both inorganic and organic forms are excreted in urine. Most arsenic leaves the body within several days, although can may remain for several months.

On average, how much arsenic is a person exposed to?

Soil contains average levels of about 5,000 parts of arsenic per billion parts of soil (ppb). Levels in food are about 20-140 ppb and levels in water are about 2 ppb. Fish and shellfish may contain high levels of organic arsenic. Levels in air are usually about 0.02-0.10 micrograms per cubic meter. Of these sources, food is usually the largest source of exposure. The total intake from these sources is about 50 micrograms each day.

How can arsenic affect my health?

Inorganic arsenic can affect the skin, nervous system, respiratory system, kidneys, and gastrointestinal system. Organic arsenic is much less harmful than the inorganic form of arsenic, but may cause similar health effects at high levels.

Long-term ingestion of inorganic arsenic can cause darkening of the skin and the appearance of small corns or warts on the palms, soles, and torso. Drinking water contaminated with high levels of arsenic has been associated with increased risk of skin, lung, bladder, and kidney cancer.

Breathing high levels of inorganic arsenic may cause a sore throat, lung irritation, and some of the mentioned skin effects. Though the exposure level that produces these effects is uncertain, it is

likely more than 100 micrograms per cubic meter. Direct skin contact with inorganic arsenic compounds can cause skin irritation, including redness and swelling.

Can arsenic affect my unborn child?

Although there is no good evidence that arsenic can harm pregnant women or their fetuses, studies in animals show that doses of arsenic that are large enough to cause illness in pregnant females may cause low birth weight, fetal malformations, or fetal death.

Is there a medical test to show whether I have been exposed to arsenic?

There are tests to measure the level of arsenic in blood, urine, hair, or fingernails. A urine test is the most reliable to determine arsenic exposure that has happened within a few days. Tests on hair and fingernails can measure exposure to high levels of arsenic over the past 6-12 months. These tests cannot predict whether one will develop lung cancer or other harmful effects.

What is the treatment for elevated arsenic levels?

The primary treatment for elevated arsenic levels is to reduce or prevent exposure to arsenic. If you are concerned about possible exposure to arsenic, contact your health care provider or the American Association of Poison Control Centers at 1-800-222-1222.

How can I limit my exposure to arsenic?

If you live in an area where there are naturally high levels of arsenic in the water or soil, limit your exposure to the soil and consider using municipal or bottled water. If you work in a job where you may be exposed to arsenic, understand that you may carry arsenic home with you on your clothes or in your hair. Be sure to shower and change your clothes before going home. If you use arsenic-treated wood, be sure to wear a dust mask, gloves, and protective clothing to reduce your exposure to sawdust.

What is the air quality standard for arsenic?

There is no ambient air standard for arsenic. Occupational Safety and Health Administration (OSHA) has set a maximum permissible limit of 10 microgram arsenic per cubic meter of indoor air per 8-hour shifts and 40-hour work week.

What is the drinking water standard for arsenic?

In January 2006, the U.S. Environmental Protection Agency (EPA) set a maximum contaminant level (MCL) for arsenic in drinking water at 10 ppb.

Have other governmental agencies made recommendations to protect human health?

The EPA Reference Dose (RfD) for inorganic arsenic is 0.0003 milligrams per kilogram body weight per day (mg/kg/day). The Agency for Toxic Substances and Disease Registry’s (ATSDR) Minimal Risk Level (MRL) for acute oral ingestion is 0.005 mg/kg/day and chronic oral ingestion is 0.0003 mg/kg/day.

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Where can I get more information on arsenic?

- If you have concerns about arsenic, contact your healthcare provider
- You may also call your local health department if you have questions or concerns about arsenic. A directory of local health departments is located at http://www.vdh.virginia.gov/local-health-districts/.
- Visit the Centers for Disease Control and Prevention website at http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=3

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